

# Accurate Target Location and the Maneuver Shooter: Are We Ready to Shoot?

By Sergeant First Class  
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**T**oday's Army has the technology to achieve first round effects on the enemy with fire support systems. Yet maneuver commanders don't trust indirect fires because the majority of fire missions are ineffective. Why?

In analyzing the missions called by forward observers (FOs), scouts and maneuver shooters, the ineffectiveness is frequently due to inaccurate target location. Operator knowledge of equipment, improper pre-combat checks (PCCs) and pre-combat inspections (PCIs), and poor synchronization of fires with the scheme of maneuver contribute significantly to target inaccuracies.

All fire supporters are familiar with the five requirements for accurate, predicted fires: (1) accurate target location, (2) accurate firing unit location, (3) accurate weapon and ammunition data, (4) accurate meteorological information and (5) accurate computational procedures. As fire supporters, we start the process by calculating accurate target location and size. Regardless of the type of observer, the steps to calculating an accurate target location must be performed correctly or the possibility for error increases.

Accurate target location begins with home station training. Too many times soldiers arrive at the National Training Center (NTC) at Fort Irwin, California, unprepared to perform at their respective skill levels. This is unacceptable and unfair to our soldiers who depend on their chain of command to train them for combat. At the NTC, sometimes soldiers

can't operate their equipment or even read a map.

By developing an effective training program, properly conducting PCCs/PCIs and ensuring soldiers thoroughly understand how to use their equipment, maneuver shooters and fire supporters alike can locate and engage targets with accurate, devastating indirect fires.

This article focuses on conducting proper PCCs and PCIs to ensure shooters locate targets accurately when they call for fires and outlines the results of a study at the NTC that shows why targets are often located inaccurately.

**Improper PCCs/PCIs.** This is a negative trend we see in the performance of junior leaders. NCOs and junior officers must conduct these checks and inspections before each mission to ensure soldiers can accomplish their assigned tasks.

**Fire Support Equipment.** All too often we see a fire support team (FIST) occupy its observation post (OP) only to realize it has no charged batteries for its ground/vehicular laser locator designator (G/VLLD) or mini eye-safe laser infrared observation set (MELIOS), no electromagnetic interference filter (EMI), a broken piece of equipment that could have been exchanged with another team for the mission, a MELIOS improperly calibrated and (or) the FIST vehicle (FIST-V) north-seeking gyro (NSG) misaligned.

Failure to conduct proper PCCs/PCIs causes observers to rely on a less accurate means of target location, such as

binoculars and compass, thus increasing the likelihood of error.

The equipment most units use are the FIST-V, G/VLLD and MELIOS. This equipment requires initialization, calibration and boresighting before it tracks, lases and calculates correct target location data.

The FIST-V (M981) has a targeting station control display (TSCD) and a NSG. The TSCD must be initialized with a universal transverse mercator (UTM) and a 10-digit grid with altitude. The NSG will not complete initialization until the vehicle easting, northing and altitude have been entered manually. If the TSCD is not initialized and the TSCD test is not complete, the TSCD will apply the wrong azimuth when lasing a target, resulting in an inaccurate target location.

**Maneuver Equipment.** Maneuver shooters use similar equipment in the M1A1, M1A2, M1A2 tank with separate enhancement program (SEP) and the M2A2 and M2A2 Operation Desert Storm (ODS) versions of the Bradley infantry fighting vehicle. Each of these systems differs in its capabilities, and soldiers must be familiar with them to use the equipment most effectively.

The M1A1 Abrams tank uses a precision lightweight global positioning system receiver (PLGR) to track its location on the battlefield. Its laser range-finder (LRF) will provide only the range to the target. However, M1A1s can't lase with the multiple integrated laser engagement system (MILES) installed,

forcing crews to operate in a degraded mode. At the NTC during force-on-force, all Abrams calls-for-fire are requested using a map without taking advantage of the tank's technology.

The M1A2 has a positive navigation (POS/NAV) system that must be initialized by manually inputting a known grid generally taken from a PLGR. This should be inputted when the tank is powered up. The POS/NAV will initialize with the last position and heading stored. If the tank is powered up without a POS/NAV installed or with the POS/NAV circuit breaker set to "Off," the tank position displayed will be incorrect.

Although the system is quite accurate, periodic updates may be required to maintain current position and heading data during operations. To update POS/NAV data, the tank position and (or) heading must be determined; the data can be taken from the PLGR or by lasing a target to calculate self-location. Finally, correct data must be entered to adjust for track slippage in theater, thereby maintaining an accurate grid location.

The M1A2 SEP has a PLGR to help run the POS/NAV and the LRF, which is eye-safe. This enhancement negates the necessity of adjusting for track slippage.

All of these systems should be initialized as prescribed by their technical manuals (TMs) during PCCs. If a maneuver soldier lases a target with the LRF and the POS/NAV has not been initialized, he will calculate an inaccurate target location.

The M2A2 ODS Bradley fighting vehicle has an integrated sight unit (ISU) and Bradley eye-safe laser rangefinder (BELRF). The ISU and BELRF should be boresighted as outlined in the TM.

The M2A2 ODS PLGR is hooked into the system with the POS/NAV. When a soldier turns the system on, he must initialize the POS/NAV with his location. This information is received from the PLGR. Once the system is initialized, he must calibrate the digital compass system (DCS) to the area of operations. If the DCS is not calibrated, he must conduct the calibration steps outlined in the TM. If the PLGR is not set up properly or if the DCS has not been calibrated, the soldier will calculate an inaccurate target location.

The M2A2 has no eye-safe laser rangefinder and no POS/NAV. Its position is tracked with a PLGR; therefore, the call-for-fire coming from this shooter will be conducted with a PLGR and map,

most likely by an untrained observer.

For all these pieces of equipment, the PLGR must be set up correctly and have the current crypto daily key loaded to achieve maximum accuracy.

**NTC Target Location Error Study.** Through research conducted at the NTC using target accuracy tracking sheets over a six-month period, we determined many causes of target location errors. The observer/controllers conducting the study randomly picked different observers to lase a known target. These observers consisted of scouts, an M1A1, an M2A2, FIST-Vs and dismounted observers.

The results showed that 80 percent of scout fire missions were ineffective due to their MELIOS not being calibrated properly or having inadequately charged batteries.

During force-on-force, most observers in the M1A1 operating in the degraded mode called for the wrong mission—they requested fire-for-effect missions instead of adjusting fires.

We have not collected data on the M1A2 and M1A2 SEP for target accuracy at the NTC.

The observers operating out of M2A2 ODS gave inaccurate target locations because, in most cases, the crews didn't calibrate properly. For example, if an M2A2 ODS were calibrated at home station with a declination of zero degrees, then when deployed to the NTC with a declination of 17 degrees and without new calibration, the vehicle would apply the wrong azimuth when lasing a target.

Because the NTC does not have a suitable calibration site, most calibrations are not conducted. It is hard to find terrain that is suitable for each step of the calibration; therefore, we generally receive inaccurate target locations from the M2A2 ODS.

The FIST-Vs most often provide inaccurate target locations because the FISTs have been initializing the TSCD incorrectly. These observers are not re-initializing the NSG, which must be done if realignment has not been conducted in the last four hours or if an error of three mils has been found during realignment. Realignment should occur every hour of operation in an observation post (OP) or after arriving at a new location.

If FISTs do not re-align or re-initialize the NSG and lase targets, the FIST-Vs will apply the wrong azimuths, producing an inaccurate target locations. TM

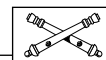
9-2350-266-10, Page 2-321 provides step-by-step procedures for conducting these tasks.

Dismounted observers are providing inaccurate target locations because FISTs/FOs aren't placing the correct azimuths on their tripods, have not declinated their M2 compasses, aren't applying the proper declination to their lensatic compasses or are forgetting to apply any of these steps. If the observer realizes his equipment isn't working properly, he should be prepared to conduct a fire mission using his map.

Most FOs don't have an observed fire fan, protractor or PLGR with batteries to help them locate targets. They then must use a map spot, just like maneuver shooters. Additionally, most of the dismounted observers call for fire-for-effect missions instead of adjusting fires on to the target.

The result of this data collection reinforces the importance of conducting proper PCCs/PCIs. Because PCCs/PCIs are not being performed correctly, observers are resorting to using maps and compasses that, nine times out of ten, will be inaccurate.

During home station training, units must use all their TMs, develop fire support and maneuver shooter crew drills, train maneuver and fire supporters on their equipment during command maintenance or opportunity training, and update unit tactical standing operating procedures (TACSOP). By doing so, indirect fires can achieve first round effects on the enemy and regain the respect and confidence of our maneuver leaders.



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